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for the coming year, and these officers were unanimously elected:

President—C. R. Mann, University of Chicago.

Secretary-Treasurer—Eugene R. Smith, Brooklyn Polytechnic Institute.

Members of the Executive Committee—J. T. Rorer, William Penn High School, Philadelphia; W. Segerblom, Phillips Exeter Academy; I. N. Mitchell, State Normal School, Milwaukee, Wis.

Professor C. H. Judd, of the University of Chicago, addressed the federation on the topic, "Scientific Experimental Investigation of Education." The speaker indicated that opinions concerning education were usually based upon rather vague and uncertain data. He urged that problems in education were capable of solution by scientific experiment and that they should be solved in that way. Several experiments were presented as types which might be followed.

Mr. H. R. Linville, of Jamaica, N. Y., presented an address on "Old and New Ideals in Biology."

The meeting adjourned subject to the call of the executive committee.

C. R. MANN,
Secretary

THE AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS

THE twenty-second annual meeting of the American Association of Economic Entomologists was held at the Harvard Medical School (Brookline), Boston, Mass., December 28 and 29, 1909. The first session was called to order by President W. E. Britton, of New Haven, Conn., who presided throughout the meeting, and who delivered the annual address on "The Official Entomologist and the Farmer." The program was crowded with papers which were of great economic importance to the entomologist and the agriculturist, although a few were more technical in character and dealt with some of the fundamental principles of scientific investigation of entomological matters. A discussion of different methods used in research work was of particular interest, as were also the reports of the progress that is being made in the field and parasite work in New England for the purpose of controlling the gypsy and brown-tail moths. A report by Dr. W. P. Headen, of Colorado, concerning the injury to fruit trees caused by arsenical spraying and the discussions that followed brought out many new ideas on this important subject. An exhibit made by the local entomologists and members which was held in an adjoining room contained samples of apparatus and breeding devices, as well as

insect collections, which added much interest to the meeting. On Tuesday evening the association and the Entomological Society of America were the guests of the Cambridge Entomological Club and on Thursday morning the members had the opportunity of witnessing a spraying demonstration at Arlington with high power sprayers, as the guests of Mr. H. L. Frost.

The attendance at each session numbered over 100 members and visitors, nearly every section of the United States and Canada being represented.

The association commended the work which is being done to control the gypsy and brown-tail moths in New England, endorsed the bill before Congress to provide for the establishment of standards of purity of insecticides and fungicides and advocated the passage by Congress of a national law to prevent the importation of dangerously injurious insects and fungus diseases from foreign countries.

The report of the secretary showed that the association was increasing in membership and was in good financial condition. The *Journal of Economic Entomology*, which is the official organ of the association, was also reported by the business manager to be in a thriving condition.

The following officers were elected for the ensuing year:

President—Professor E. D. Sanderson, Durham, N. H.

First Vice-president—Dr. H. T. Fernald, Amherst, Mass.

Second Vice-president—Professor P. J. Parrott, Geneva, N. Y.

Secretary—A. F. Burgess, Washington, D. C.

SOCIETIES AND ACADEMIES

THE GEOLOGICAL SOCIETY OF WASHINGTON

At the 226th meeting of the society, held at the George Washington University on Wednesday, January 26, 1910, Mr. Edson S. Bastin informally exhibited specimens of pegmatites whose quartzes had been tested by Messrs. Wright and Larsen.

Regular Program

Some Pegmatites from Southern California: W. T. SCHALLER.

The pegmatites of Southern California which have been exploited for their valuable gem minerals (tourmaline, spodumene, etc.) are granitic rock bodies filling fissures in gabbro. Many of these bodies consist of two parts of approximately equal thickness—namely, an upper coarse granite and a lower fine-grained banded garnet aplite.

The lithium and gem minerals occur in the bottom of the upper part and consequently near the center of the entire body. A number of distinct structural varieties of pegmatite may be recognized, all formed by vein processes.

The Cobalt Mining District of Ontario: Mr. S. F. EMMONS.

The features of the Cobalt silver deposits that most strikingly differentiate them from those of most mining districts are:

Mineralogically, the predominance of the metals cobalt, nickel, silver and bismuth, with an almost total absence of lead and zinc, and their prevalent combination with arsenic and antimony rather than with sulphur.

Structurally, the extreme narrowness of all the rock fractures, and the general absence of evidence of any considerable displacement such as is afforded by slickensides or clay selvages. Nevertheless, very decided proof exists that the veins are true fault fractures, not contraction cracks, in that they contain dragged-in fragments of wall rock, that they pass uninterruptedly from one rock formation to another, even though separated by a great unconformity, and that in the coarse so-called conglomerate, in which they were first discovered, they cut through matrix and included fragments indifferently. They seem to be fractures that have been produced under so great a load of overlying rocks that movement had been greatly restricted.

Genetically, the predominance of silver in the metallic state over its combinations with sulphur, arsenic and antimony; and the remarkably abrupt falling off in the tenor of this metal from the bonanza zone, where it is measured by thousands of ounces per ton, to the ordinary low-grade cobalt vein with less than ten ounces, a change that takes place within very few feet.

These facts seem best explained on the assumption that the present veins are only the roots of veins that were originally of great vertical extent but have been mostly worn away; and that these remaining vein roots have been gradually enriched by successive leachings-back for unusually long geological periods (for both primary and secondary vein fractures are of pre-Cambrian age).

The secondary fractures within the veins that carry the most of the silver are probably not the channels through which the silver was originally introduced, but simply those which, by the admission of solutions leached down from the surface, have produced an extraordinary enrichment in this metal.

The conclusion seems warranted, therefore, that the rich silver veins are not, as was originally assumed, confined to any particular formation, and that while the bonanza portion of individual veins has a limited extent in depth, the abundance of small fractures or calcite veins, that may at any time pass into bonanza, renders the future of the district very promising.

The Mechanical Part of a Paleontologic Monograph: LANCASTER D. BURLING.

The value of a monograph depends so largely upon the accessibility of the material which it contains that current methods are believed to be inadequate for the proper presentation of the results of careful research. Some improvement in the monographic treatment of paleontologic subjects may be accomplished by the introduction of the following features. They should be regarded as merely an initial step in what is believed should be a general attempt to raise the standard of monographic methods.

1. A list giving the present reference of every generic or specific name occurring in the synonymy, arranged alphabetically by specific as well as generic and subgeneric terms.

2. Detailed localities with locality numbers (original where possible or arbitrary where taken from the literature) and a list of the localities giving them in detail (with reference to published sections if possible) and citing the included species.

3. Sections typical of each general area or province covered by the monograph, giving in one column the species occurring in the section and in a second the species occurring elsewhere throughout the larger area in their approximate stratigraphic position; tables, arranged by faunal provinces, showing at a glance the species occurring in the major subdivisions of each; and summary tables showing the general geographic and stratigraphic distribution of the species, the genera and the families, respectively.

4. Descriptive notes indicating the source from which all or any part of each reference in the synonymy may have been copied, or the place in which any part of it may be duplicated, etc., and supplementary foot-notes under each genus giving a chronologic list (with references) of the various genera to which the species now placed in the genus have been referred.

5. Complete descriptions of plates naming the type specimens, giving the locality and catalogue numbers, and outlining a complete history of each previously figured specimen.

6. A separate bibliography, list of localities and index appropriate to the volume of plates when a separate volume is necessary, both indexes being arranged under the specific as well as the generic names.

EDSON S. BASTIN,

Secretary

At the 227th meeting of the society, held at the George Washington University on Wednesday, February 9, 1910, under informal communications, Mr. David White exhibited several lantern slides prepared by the Lumière Company, showing in their natural colors the organic remains found in coals. The sections used for this trial were about seven microns in thickness and embraced cannel coals from Lesley, Ky., and Calloway County, Mo., and a brown xyloid lignite from Lehigh, N. D.

Mr. François E. Matthes described the site of an extinct waterfall in the Yosemite Valley, still conspicuous in the configuration of its north wall. The waterfall was existent only during glacial times, when the glacier in the hanging valley of Yosemite Creek sent a lobe up into the basin now known as the Eagle Peak Meadows. From the front of this lobe several streams coursed toward the canyon rim, converging near the edge and plunging over in several places but a few hundred feet apart. The cliff below receded under the action of the falls, and a marked horseshoe-shaped reentrant resulted. It is over the débris at the foot of the fall site that the lower zigzags of the Yosemite Falls trail are laid.

Regular Program

Coal-mining and Coke-making at Dawson, New Mexico: Mr. E. W. PARKER.

The plant of the Stag Canyon Fuel Company, which represents one of the highest types of coal-mining development in the United States, is located at Dawson, Colfax County, N. M., in Ts. 28 and 29 N., R. 20 E., and T. 28 N., R. 21 E. The coal property embraces part of the Raton Mountain region, and includes operations in and about Trinidad, Col., and Raton, Koehler, Van Houten and Dawson, N. M. There are two workable beds in the field, only one of which is being mined at the present time. The Dawson mines are on the lower of the two workable seams, known as the Raton or Blossburg bed. It lies nearly level and varies from 6 to 11 feet thick, with an average of about 7 feet.

The mining company is a subsidiary organization of the Phelps-Dodge interests, of Philadel-

phia, and the idealistic character of the plant is due to the beneficent influence of Dr. James Douglas, the president of the company, and to the administrative genius of Mr. E. L. Carpenter, its general manager.

The mining methods of the company, and the arrangements for handling the coal and preparing it for the coke ovens, are strictly modern throughout. Instead of the ordinary bee-hive coke ovens, modified underflue ovens are employed by which the gases from the coking operations are used for heating the ovens and also for generating the power used in the operation of the mines, the heating of the office, and other company-buildings, and for furnishing electric light to the town. Not a pound of coal is used in the power plant, which is a model of neatness and efficiency. Special provisions are made for the safety of the miners and other employees, and no shot-firing is done while any of the miners are within the mines. Careful supervision is exercised over the methods of undercutting and shearing coal and of placing shots, in order to avoid any possibility of windy or blown-out shots. A checking system is employed by which it is known that all employees are out of the mines before the shot-firers enter. The shot-firers make the electric connections, and after they have left the mines, the entrances are closed by iron gates and a red light is exposed in front of each gate in order to warn persons away and thus avoid accidents from flying débris, in case an explosion should occur.

The Stag Canyon Company further trains its men in first-aid-to-the-injured work; conducts a rescue station in which men are instructed in the handling of rescue apparatus, and a hospital service, provided for the employees at a minimum expense.

The Distribution of Platinum in the United States: Mr. DAVID T. DAY.

While recent high prices have caused active search for platinum, showing it to be rather widely distributed in many rocks, useful accumulations in the United States are at present limited to the Rambler mine, in southern Wyoming, and the Key West group of mines in Bunkerville, near eastern Nevada, and to about seven important groups of accumulations in connection with placer mines of the Pacific Slope. Most platinum was produced last year from the neighborhood of Oroville, Cal., where it occurs about in the proportion of 1 to 500 of gold. The proportion has not been determined for Trinity County, Cal., and Josephine County, Ore., the other two inland

localities. On the coast, platinum is found in the proportion of 2 to 1 of gold, near Surf, Santa Barbara County, but other places in the same region, including San Luis Obispo, show only 1 to 20 or 1 to 50 of gold.

The next important group of accumulations is found near Trinidad Head, Humboldt County, Cal., another at Crescent City, Cal., at the mouth of Smith River, Ore., and one on the South Fork of Smith River. The most important group of all extends from the mouth of Rogue River north to Coquille River. At Cape Blanco an accumulation of platinum has been found where that metal is five times as abundant as the gold. On the west coast of Washington platinum is comparatively abundant in the proportion of 1 to 10 and 1 to 15 of gold.

The Half Dome of the Yosemite Valley: Mr. FRANÇOIS E. MATTHES.

The Half Dome, like the other domes of the Yosemite region, represents a huge granite monolith that has survived the reduction of the more fissile rocks about it by virtue of the superior resistance to disintegration of its undivided mass. It is unique in that its dome form is a partial or incomplete one, being abruptly trenched on the northwest by a straight and sheer cliff face 2,000 feet in height. The curving back and sides are entirely normal, having evidently evolved through progressive exfoliation, like the bulbous exteriors of all domes. Their smooth, sweeping curves are indicative of maturity; for it is only through long-continued shelling that a monolith of irregular shape is reduced to a continuously rounded mass. At the same time, the prevailing flatness of the back and its trend, parallel with the northeast-southwest system of joints, prominent throughout the region, are clearly inherited from the structure planes that originally bounded the monolith on that side.

For the origin of the sheer front of the dome, three alternative hypotheses have been advanced:

1. The present mass is a true half dome—that is, a remnant of a much larger monolith, the other portion of which has caved off, perhaps owing to glacial undercutting in the Tenaya trough.
2. The monolith extended originally but little farther to the northwest, and has suffered reduction on that side, as on the other sides, merely through normal exfoliation. Only, the shells on the northwest side were plane instead of curved, because the initial bounding surface was plane.
3. The present front coincides essentially with the plane fissure that from the first constituted

the boundary of the monolith, and has only comparatively recently been exposed through the rapid scaling off of the thin plates of a zone of vertically sheeted rock.

The first hypothesis seems inadmissible, inasmuch as massive granites inherently break off by conchoidal fractures and not by plane fractures of the magnitude of the dome front. The second hypothesis finds some support in the overhanging shells on the top of the dome, for these plainly indicate the former extension of the monolith for a short distance to the northwest. The existence, however, of a great mass of plates clinging to the northeast end of the cliff face in the form of a conspicuous shoulder, together with the strongly accentuated fracture that separates them from the body of the monolith proper, is held to demonstrate conclusively that the monolith never did extend beyond its present front, but was actually bounded there by a zone of thinly sheeted rock. Only toward the top of the front has exfoliation set in and commenced its rounding off process (under the overhang), as is patent from the profile view of the dome obtained from the Quarter Domes.

FRANÇOIS E. MATTHES,
Secretary

THE BIOLOGICAL SOCIETY OF WASHINGTON

THE 467th regular meeting of the society was held March 5, 1910, in the west hall of George Washington University, President T. S. Palmer in the chair.

The following communications were presented:

Remarks on a Restoration of Basilosaurus cetoides: J. W. GIDLEY.

Remains of this species were first discovered in Alabama in 1834 and Harlan applied to it its present generic name. Owen, in 1839, recognized its mammalian character and renamed it *Zeu-glodon*. The present restoration is based on portions of two individuals, one of which furnishes the anterior and the other the posterior part of the animal. The restoration is almost complete. This mammal is somewhat distantly related to the whales. It has a total length of about 35 feet and a skull 5 feet long.

The Stridulations of some Katydid: H. A. AL-LARD. (Read by the recording secretary.)

The author studied the stridulations of several members of the Locustidæ at Thompson's Mills, Ga., and at Plummer's Island, on the Potomac, above Washington City. The peculiar noises made by the following species were studied:

Scudderia texensis, *S. furcata*, *Amblycorypha oblongifolia*, *A. rotundifolia*, *A. uhleri*, *Microcentrum retinerve*, *M. rhombifolium* and *Cyrtophyllus perspicillatus*. The last is the true katydid, and has harsher notes than any of the others named. Photographs were exhibited showing several of these species in the act of stridulation.

Japanese Goldfish: HUGH M. SMITH.

Dr. Smith exhibited water-color paintings of the ten varieties of goldfish now known and cultivated in Japan, and discussed some of the biological points connected with the goldfish and its culture. The goldfish is grown more extensively in Japan than elsewhere; and in no other country is any purely ornamental animal maintained by a larger proportion of the population. This fish has been a favorite subject for biological study in Japan; and being exceedingly plastic material it has yielded surprises to the biologist as well as the culturist.

The goldfish, like various other things now firmly established in Japan, came originally from China, the first known importation of the cultivated fish being in the year 1500. The original stock has been greatly improved by cultivation and crossing, and is now superior to any of the Chinese breeds. The goldfish was probably not indigenous to Japan and the wild, plain-colored form there found represents a reversion.

Attention was called to the views and theories of Ryder (1893): (1) that the Japanese varieties of goldfish are the most profoundly modified of any known domesticated animal organisms; (2) that the greatly enlarged fins are correlated with a degeneration of the muscular system through disuse, owing to the "continued restraint of the fish in small aquaria through many generations"; (3) that the feeble swimming powers have been "purposely cultivated by oriental fish fanciers," and the energy that would have gone into motion has reacted in the growth of fins; (4) that the enlarged caudal and other fins may serve as supplemental respiratory organs; and (5) that this hypertrophy has been "developed in physiological response to artificial conditions of respiration in the restricted and badly aerated tanks and aquaria in which the fish have been bred for centuries."

As the salient feature of goldfish culture in Japan has always been the perfect oxygenation of the water in the rearing ponds, the speaker held that any theories based on the assumption of lack of aeration are untenable.

The most remarkable morphological features of Japanese goldfish are the elimination of the dorsal

fin and the development of paired caudal and anal fins in some varieties. The division of the caudal is not merely a splitting of the superficial soft parts, but represents an actual bilateral separation of the deep-seated bony elements from which the fin arises.

The first and the last of these communications were discussed by Dr. Theodore Gill, Dr. T. S. Palmer and others.

D. E. LANTZ,
Recording Secretary

THE AMERICAN CHEMICAL SOCIETY NEW YORK SECTION

The sixth regular meeting of the session of 1909-10 was held at the Chemists' Club on March 11.

The following officers were elected for the session of 1910-11:

Chairman—Chas. Baskerville.

Vice-Chairman—Samuel A. Tucker.

Secretary and Treasurer—C. M. Joyce.

Executive Committee—Morris Loeb, G. W. Thompson, J. E. Crane and Arthur E. Hill.

The papers presented were as follows: Wm. C. Ferguson, "The Determination of Copper in Blister and Refined Copper"; Chas. Baskerville, "Scrubbing Device for Vacuum System in the Laboratory"; J. L. Sporer, "Rack for Holding Reagents in Bulk"; H. T. Beans, "A Constant Temperature Drying Oven and Gas Regulator"; S. H. Beard, "An Automatic Pipette"; C. T. G. Rogers, "Description of a Modified Pettersson and Palmquist Apparatus for the Determination of Carbon Dioxide."

C. M. JOYCE,
Secretary

THE CHEMICAL SOCIETY OF WASHINGTON

The 197th meeting was held in the Public Library on Thursday evening, March 10. President Failyer presided, the attendance being 52. The annual smoker will be held on April 9. The committee on communications was authorized to confer with the committee of the Washington Academy of Science in preparing programs for joint meetings. Dr. W. D. Bigelow, who had general charge of the construction of the new bureau of chemistry building, presented the only paper of the evening, viz., "The Construction and Equipment of a Chemical Laboratory." The paper was illustrated with lantern slides.

J. A. LECLERC,
Secretary